

WHAT IS CLAIMED IS:

1. A surface emitting semiconductor laser which is equipped with a resonator and includes a first reflection layer in which a light emitting region is formed, an active layer and a second reflection layer formed so as to sandwich the active layer between the first reflection layer and itself, wherein the light emitting region includes

a boundary region for suppressing the light emission of oscillation modes except for a specific oscillation mode; and

a plurality of divided regions which are substantially divided by the boundary region to produce a light emitting spot corresponding to the specific oscillation mode.

2. A surface emitting semiconductor laser according to claim 1, wherein the boundary region is a recess formed in a part of a surface layer which forms a light emitting surface of the light emitting region.

3. A surface emitting semiconductor laser according to claim 1, wherein the boundary region is a projection formed at a part of a surface layer which forms a light emitting surface of the light emitting region.

4. A surface emitting semiconductor laser according to claim 2, wherein the recess is one or more holes.

5. A surface emitting semiconductor laser according to claim 2, wherein the recess is a groove.

6. A surface emitting semiconductor laser according to claim 1, wherein the size of the light emitting region is large enough to permit emission of light of the specific oscillation mode.

7. A surface emitting semiconductor laser according to claim 1, wherein a reflectivity of the resonator in the boundary region is smaller than a reflectivity of the resonator in the divided region.

8. A surface emitting semiconductor laser according to claim 1, further comprising a current confinement layer that is oxidized so as to have a non-oxidation region corresponding to the amount of current injected necessary for emitting light of the specific oscillation mode provided between the first reflection layer and the active layer.

9. A surface emitting semiconductor laser according to claim 1, wherein the oscillation mode is a linearly polarized mode and wherein the specific oscillation mode is a linearly polarized mode of one or more orders.

10. A surface emitting semiconductor laser according to claim 2, wherein a layer adjacent to the surface layer is an

etching preventing layer made of a material for preventing etching.

11. A method for manufacturing a surface emitting semiconductor laser, the method comprising the steps of:

laminating in sequence, on the main surface of a semiconductor substrate, a lower reflection layer, an active layer in which a quantum well layer is formed, and an upper reflection layer having a surface layer which forms a light emitting surface of a light emitting region on an inner layer side or an upper layer side of said upper reflection layer;

forming a post portion in the shape of a pillar with at least the upper reflection layer partially remaining; and

forming a boundary region for suppressing light emission of oscillation modes except for a specific oscillation mode and substantially forming a light emitting spot corresponding to the specific oscillation mode by processing a part of the region of the surface of the upper reflection layer which is exposed to the surface of the post portion.

12. A method for manufacturing a surface emitting semiconductor laser according to claim 11, wherein the step of laminating includes a step of forming an etching preventing layer on the lower layer side of the surface layer.

13. A surface emitting semiconductor laser according to claim 1, wherein the media of the surface layers which form the

light emitting surfaces of neighboring divided regions have different refractive indices so that the light emitting spots emitted from the neighboring divided regions have the same phase.

14. A surface emitting semiconductor laser according to claim 13, wherein the cross sections of the plurality of divided regions are alternately formed in the shape of a recess and in the shape of a projection.

15. A surface emitting semiconductor laser according to claim 14, wherein when the cross section is formed in the shape of a recess, the shape of the recess is formed by etching and when the cross section is formed in the shape of a projection, the shape of the projection is formed by laminating at least one of a dielectric film, a semiconductor film and a transparent metallic film.

16. A surface emitting semiconductor laser which is equipped with a resonator and includes a first reflection layer in which a light emitting region is formed, an active layer and a second reflection layer formed so as to sandwich the active layer between the first reflection layer and itself, wherein the light emitting region includes a plurality of divided regions for producing light emitting spots corresponding to a specific oscillation mode and wherein the media of the surface layers which form the light emitting surfaces of neighboring

divided regions have different refractive indices so that the light emitting spots emitted from the neighboring divided regions have the same phase.

17. A surface emitting semiconductor laser according to claim 16, wherein

the boundary region of the neighboring divided regions of the plurality of divided regions suppresses light emission of oscillation modes except for the specific oscillation mode.

18. A surface emitting semiconductor laser according to claim 16, wherein the cross sections of the plurality of divided regions are alternately formed in the shape of a recess and in the shape of a projection.

19. A surface emitting semiconductor laser according to claim 18, wherein when the cross section is formed in the shape of a recess, the shape of the recess is formed by etching and when the cross section is formed in the shape of a projection, the shape of the projection is formed by laminating at least one of a dielectric film, a semiconductor film and a transparent metallic film.

20. A surface emitting semiconductor laser according to claim 17, wherein the boundary region is a stepped portion when cross sections of the plurality of divided regions are alternately formed in the shape of a recess and in the shape

of a projection.

21. A surface emitting semiconductor laser according to claim 20, wherein the stepped portion is tapered.

22. A surface emitting semiconductor laser according to claim 21, wherein a dip extending in the direction of depth from the stepped portion is formed so as to emphasize the stepped portion formed in the boundary region between the neighboring divided regions.

23. A surface emitting semiconductor laser according to claim 22, wherein when the cross section is formed in the shape of a recess by etching, the dip is formed at the same time when the recess is formed.